

Leif Johansson

The Semantic Web and Model Driven Architecture (and some concrete stuff too...)



OM2

... you just heard about it from Roland



The Semantic Web

- Tim Berners-Lee (who else...)
 - <http://www.w3.org/2001/sw/>
 - RDF
 - Resource Description Format
 - <http://www.w3.org/TR/rdf-syntax-grammar/>
 - OWL
 - Web Ontology Language
 - <http://www.w3.org/TR/owl-ref/>



OWL Example

Class definition

```
<rdfs:Class rdf:about="http://xmlns.com/foaf/0.1/Person"
  rdfs:label="Person" rdfs:comment="A person." vs:term_status="testing">
  <rdfs:subClassOf rdf:resource="http://xmlns.com/wordnet/1.6/Person"/>
  <rdfs:subClassOf rdf:resource="http://xmlns.com/foaf/0.1/Agent"/>
  <rdfs:subClassOf rdf:resource="http://www.w3.org/2000/10/swap/pim/contact#Person"/>
  <rdfs:subClassOf rdf:resource="http://www.w3.org/2003/01/geo/wgs84_pos#SpatialThing"/>
  <rdfs:isDefinedBy rdf:resource="http://xmlns.com/foaf/0.1/" />
  <owl:disjointWith rdf:resource="http://xmlns.com/foaf/0.1/Document"/>
  <owl:disjointWith rdf:resource="http://xmlns.com/foaf/0.1/Organization"/>
  <owl:disjointWith rdf:resource="http://xmlns.com/foaf/0.1/Project"/>
</rdfs:Class>
```

OWL Example

Class definition

Class inheritance

```
<rdfs:Class rdf:about="http://xmlns.com/foaf/0.1/Person"
  rdfs:label="Person" rdfs:comment="A person." vs:term_status="testing">
  <rdfs:subClassOf rdf:resource="http://xmlns.com/wordnet/1.6/Person"/>
  <rdfs:subClassOf rdf:resource="http://xmlns.com/foaf/0.1/Agent"/>
  <rdfs:subClassOf rdf:resource="http://www.w3.org/2000/10/swap/pim/contact#Person"/>
  <rdfs:subClassOf rdf:resource="http://www.w3.org/2003/01/geo/wgs84_pos#SpatialThing"/>
  <rdfs:isDefinedBy rdf:resource="http://xmlns.com/foaf/0.1/" />
  <owl:disjointWith rdf:resource="http://xmlns.com/foaf/0.1/Document"/>
  <owl:disjointWith rdf:resource="http://xmlns.com/foaf/0.1/Organization"/>
  <owl:disjointWith rdf:resource="http://xmlns.com/foaf/0.1/Project"/>
</rdfs:Class>
```

OWL Example

Class definition

Class inheritance

```
<rdfs:Class rdf:about="http://xmlns.com/foaf/0.1/Person"  
  rdfs:label="Person" rdfs:comment="A person." vs:term_status="testing">  
  <rdfs:subClassOf rdf:resource="http://xmlns.com/wordnet/1.6/Person"/>  
  <rdfs:subClassOf rdf:resource="http://xmlns.com/foaf/0.1/Agent"/>  
  <rdfs:subClassOf rdf:resource="http://www.w3.org/2000/10/swap/pim/contact#Person"/>  
  <rdfs:subClassOf rdf:resource="http://www.w3.org/2003/01/geo/wgs84_pos#SpatialThing"/>  
  <rdfs:isDefinedBy rdf:resource="http://xmlns.com/foaf/0.1/" />  
  <owl:disjointWith rdf:resource="http://xmlns.com/foaf/0.1/Document"/>  
  <owl:disjointWith rdf:resource="http://xmlns.com/foaf/0.1/Organization"/>  
  <owl:disjointWith rdf:resource="http://xmlns.com/foaf/0.1/Project"/>  
</rdfs:Class>
```

Package



OWL Example

Class definition

Class inheritance

```
<rdfs:Class rdf:about="http://xmlns.com/foaf/0.1/Person"
  rdfs:label="Person" rdfs:comment="A person." vs:term_status="testing">
  <rdfs:subClassOf rdf:resource="http://xmlns.com/wordnet/1.6/Person"/>
  <rdfs:subClassOf rdf:resource="http://xmlns.com/foaf/0.1/Agent"/>
  <rdfs:subClassOf rdf:resource="http://www.w3.org/2000/10/swap/pim/contact#Person"/>
  <rdfs:subClassOf rdf:resource="http://www.w3.org/2003/01/geo/wgs84_pos#SpatialThing"/>
  <rdfs:isDefinedBy rdf:resource="http://xmlns.com/foaf/0.1/" />
  <owl:disjointWith rdf:resource="http://xmlns.com/foaf/0.1/Document"/>
  <owl:disjointWith rdf:resource="http://xmlns.com/foaf/0.1/Organization"/>
  <owl:disjointWith rdf:resource="http://xmlns.com/foaf/0.1/Project"/>
</rdfs:Class>
```

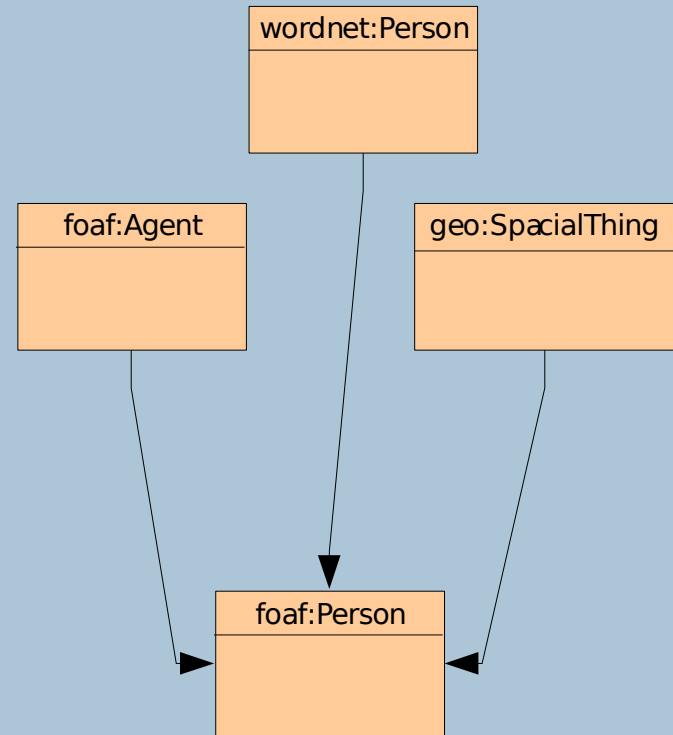
Package

Is Not A...



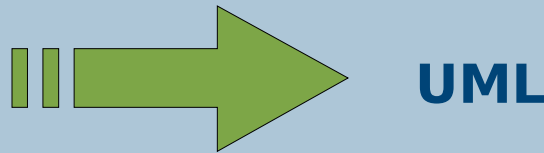
OWL

- Multiple inheritance (!)
- Managed namespace
- Packages are URI:s



UML & MOF

- Universal Modelling Language
 - <http://www.omg.org/UML>
 - <http://www.omg.org/mof>
- Rumbaugh, Jacobson & Booch (ca 1996)
 - Objectory
 - Rational
 - Booch
- Several diagram types
 - static (class diagram)
 - deployment
 - use-case
 - ...



MDA

- How do you port a Cobol application to Java?



MDA

- How do you port a Cobol application to Java?
- **Don't!**
 - Make your specification complete enough for both



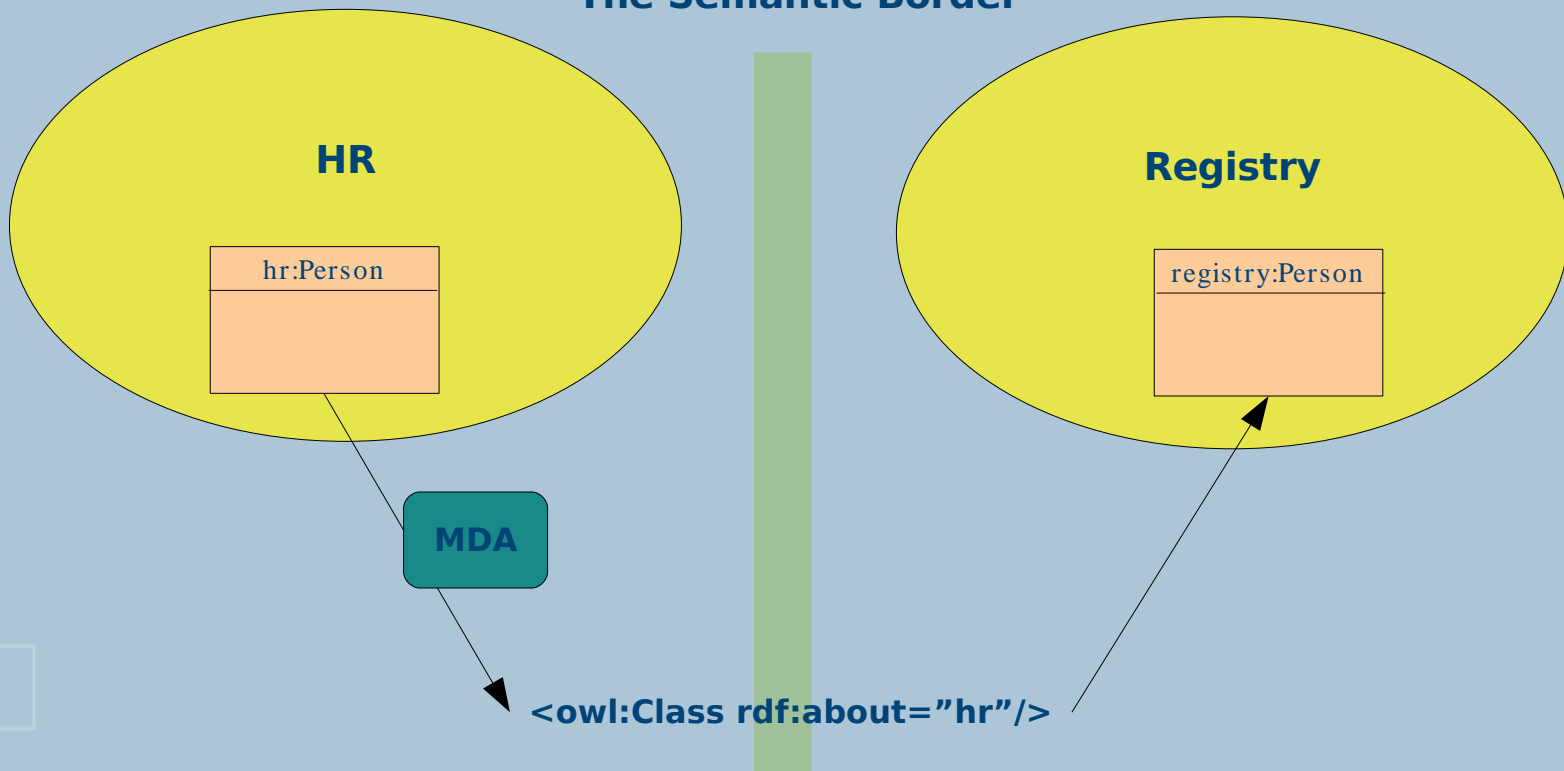
MDA

- MDA Tools
 - Code generation
 - Refactoring as model transformation



MDA & OWL & UML = OM2 (my style)

The Semantic Border



OWL & OM2 benefits

- Bridge ontologies
 - owl:equivalentProperty
 - Multiple inheritance
- Code/bean generation
 - <http://rdfreactor.ontoware.org/>
 - <http://jastor.sourceforge.net/>
 - *OM2 Python library*



And now for...

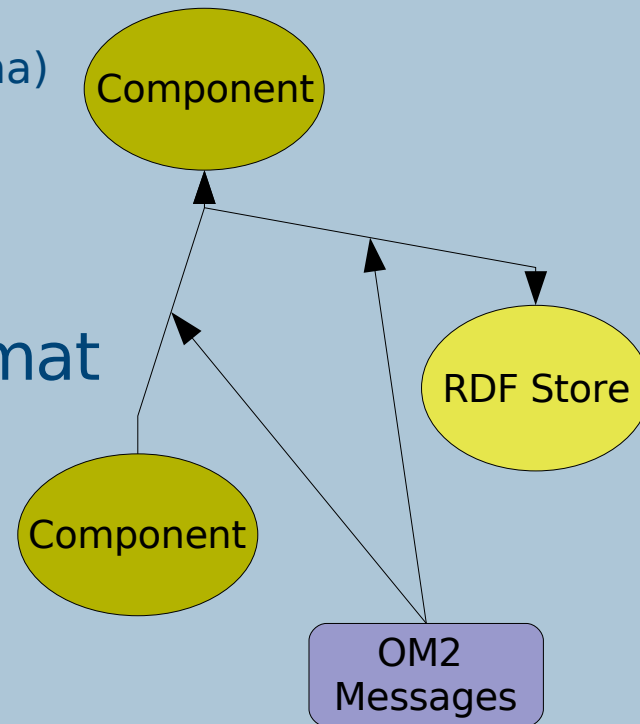
any quasi-concrete stuff I can come up with...

(to motivate all this mumbo-jumbo)



OM2 ::= COMPONENTS OF { ...

- Generalized registry
 - RDF datastore
 - Mulgara (formerly Kowari/Tucana)
 - 3store
 - Sesame
 - Nexus-backend
- OWL-based message format
- Multiple transports
 - REST
 - SOAP (Document-style)
 - XMPP (JEP-0060/JEvent)



}

- Generalizable components
 - Transaction managers
 - Orchestration/synchronization
- Multiple toolkits
 - python/twisted
 - j2ee



Sektionen för IT och media
Stockholms universitet
Frescati Hagväg 10
106 91 Stockholm
Tfn: 16 1999

<http://www.it.su.se>

